REMARKS

Reconsideration of the present application is respectfully requested in view of the above amendments and the following remarks. Claims 1-13 are pending in the application; claims 1-7 and 13 are currently under examination, and claims 8-12 are withdrawn. Without acquiescence to the rejection and merely to expedite prosecution, new claim 14 is added. No new matter has been added by this addition to the claims. Support for new claim 14 can be found in the specification as originally filed, especially in claim 1. Applicants respectfully request entry and consideration of new claim 14. Applicants also kindly thank the Examiner for acknowledging priority to Korean Application No. 10-2003-0080299.

REJECTIONS UNDER 35 U.S.C. § 102

Claims 1, 2, 7, and 13 stand rejected under 35 U.S.C. § 102(b) for alleged lack of novelty over Maddon *et al.* (U.S. Patent No. 6,034,223). The Examiner asserts that Maddon *et al.* disclose a human Fc region chemically linked to a non-peptide toxin via site specific linkage through the N-linked sugar residues present on the Fc region. The Examiner then alleges that the structural features of the instant claims read on the molecule of Maddon *et al.*

Applicants traverse this rejection and submit that the instant claims satisfy the requirements of novelty over Maddon *et al.* Embodiments of the instant claims relate, in pertinent part, to an Fc fragment as a drug carrier, which is an IgG Fc, a combination thereof or a hybrid thereof, wherein the Fc fragment is covalently linked to a drug through a non-peptide linker. Certain embodiments, such as new claim 14, relate to drug carrier molecules ***consisting essentially*** of an Fc fragment covalently linked to a drug through a non-peptide linker.

Maddon *et al.* fail to disclose each feature of the instant claims. In particular, Maddon *et al.* are limited to disclosing a ***fusion protein*** of CD4 and an Fc molecule, regardless of the presence of a non-peptide toxin. However, as disclosed in the instant specification, "the linkage of the present invention of a protein and the Fc fragment of the present invention is featured in that it is ***not a fusion*** by a conventional recombinant method" (*see* page 28, lines 6-8) (emphasis added). By comprising a ***fusion protein***, *i.e.,* two proteins joined together by a peptide linker, it is respectfully submitted that the CD4/Fc heterodimer of Maddon *et al.* fails to

anticipate the presently claimed Fc-based drug carriers, which are linked to a drug via a ***non-peptide linker***.

Further, Maddon *et al.* fail to disclose each feature of new claim 14. For instance, Maddon *et al.* fail to disclose an Fc fragment as a drug carrier, ***consisting essentially of*** the Fc fragment covalently linked to a drug through a non-peptide linker. In the present case, it is respectfully submitted that the transitional phrase "***consisting essentially of***" focuses the scope of a claim to the specified materials "and those that do not *materially* affect the *basic* and *novel* characteristic(s)" of the claimed invention. *See* M.P.E.P. § 2111.03, citing *In re Herz*, 537 F.2d 549, 551-52 (CCPA 1976) (emphasis in original).

Here, Maddon *et al.* are limited to teaching a ***fusion protein*** of CD4 and an Fc fragment, directed to CD4-based therapeutics, in which the CD4 portion of the fusion protein ***necessarily targets*** that protein to gp120 molecules on the surface of HIV virions, or other CD4 ligands, irrespective of the presence of non-peptide toxins referred to by the Examiner at page 3 of the Action. However, in view of the basic and novel characteristics of the presently claimed Fc-based fragments, such as increased bioavailability of a given drug attached to the Fc fragment via a non-peptide linkage, the presence of a CD4 protein ***fused*** to the Fc fragment would ***materially*** affect those characteristics, such as by targeting the drug to unintended sites, and/or by interacting undesirably with CD4 ligands. Such interactions would necessarily interfere with the basic features of the presently claimed molecules. Thus, even assuming, *arguendo*, that the CD4/Fc ***fusion protein*** of Maddon *et al.* has a toxin attached via a non-peptide linker, new claim 14 should not be construed to read on such a molecule. In this manner, by necessarily excluding a CD4 molecule ***fused*** to an Fc fragment because of the former's ***material*** affect on the latter (*e.g.,* undesired targeting), Applicants respectfully submit that the Fc-based drug-carrier of new claim 14, ***consisting essentially*** of the Fc fragment covalently linked to a drug through a ***non-peptide linker***, is not anticipated by the disclosure in Maddon *et al.*

In view of the remarks and amendments provided herein, Applicants submit that the instant claims satisfy the requirements of novelty over Maddon *et al.*, and respectfully request reconsideration and withdrawal of this rejection under 35 U.S.C. § 102(b).

REJECTIONS UNDER 35 U.S.C. § 103

Claims 1-7 and 13 stand rejected under 35 U.S.C. § 103(a) for alleged obviousness over Maddon *et al.* in view of Presta (U.S. Patent No. 6,737,056). The Examiner essentially relies on Maddon *et al.* as noted above, but agrees that this reference does not teach aglycosylated IgG4 Fc fragments. However, the Examiner asserts that Presta teaches a human IgG4 region with reduced effector function that can be produced in *E. coli*, and which allegedly has the same sequence as SEQ ID NO:8. The Examiner also asserts that the *E. coli* produced IgG4 would be aglycosylated, because it is known that *E. coli* lacks glycosylation enzymes. The Examiner then asserts that it would have been obvious to substitute the IgG2 Fc region of Maddon *et al.* with the human IgG4 region of Presta.

Applicants traverse this rejection and submit that the instant claims satisfy the requirements of non-obviousness. In particular, Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness. *See In re Mayne*, 104 F.3d 1339 (Fed. Cir. 1997) (The USPTO has the burden of showing a *prima facie* case of obviousness).

At a minimum, it must be demonstrated that the combined references teach or suggest all the claim features, and even assuming, *arguendo,* that the combination of references teaches each claim feature, the Examiner must provide an explicit, apparent reason to combine these features in the fashion claimed by the Applicant with a reasonable expectation of success. *See KSR v. Teleflex, Inc.,* No. 04-1350 at 4, 14 (U.S. Apr. 30, 2007) ("A patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art").

The cited references fail to teach or suggest each feature of the instant claims. To the contrary, as discussed in the section 102(b) rejection above, Maddon *et al.* are limited to teaching a ***fusion protein*** of CD4 and an Fc molecule, regardless of the presence of a non-peptide toxin. However, as disclosed in the instant specification, "the linkage of the present invention of a protein and the Fc fragment of the present invention is featured in that it is ***not a fusion*** by a conventional recombinant method" (*see* page 28, lines 6-8) (emphasis added). By comprising a ***fusion protein***, *i.e.,* two proteins joined together by a ***peptide linker***, it is respectfully submitted that the CD4/Fc heterodimer of Maddon *et al.* fails to teach or suggest

each feature of the presently claimed Fc-based drug carriers, which are linked to a drug via a ***non-peptide linker***.

In addition, Maddon *et al.* fail to teach or suggest each feature of new claim 14. For instance, as detailed in the section 102(b) rejection above, by necessarily excluding a CD4 molecule ***fused*** to an Fc fragment because of the former's ***material*** affect on the latter (*e.g.,* undesired targeting), Applicants respectfully submit that the Fc-based drug-carrier of new claim 14, ***consisting essentially*** of the Fc fragment covalently linked to a drug through a non-peptide linker, is not taught or suggested by the disclosure in Maddon *et al.*

Presta does not remedy the deficiencies in Maddon *et al.*, as this reference is entirely silent as to an Fc fragment covalently linked to a drug through a non-peptide linker. Therefore, in failing to teach or suggest each feature of the instant claims, including new claim 14, the cited references, alone or in combination, fail to establish the minimal elements of a *prima facie* case of obviousness.

These references also fail to motivate a person of ordinary skill in the art to practice the presently claimed subject matter with a reasonable expectation of success. Rather, since the cited references do not teach or suggest an Fc fragment covalently linked to a drug through a non-peptide linker, let alone a drug carrier molecule ***consisting essentially of*** an Fc fragment covalently linked to a drug through a non-peptide linker (*see* new claim 14), such a person would have no motivation whatsoever to practice the instant molecules. Given the deficiencies in the cited references, a person of ordinary skill in the art at the time of invention would have had to embark on whole new line of experimentation to arrive at the presently claimed subject matter, such as by attaching a non-fusion Fc fragment to a drug via a ***non-peptide linkage*** (*e.g.,* a non-peptide polymer), as recited in the instant claims. This line of experimentation cannot be found in either Maddon *et al.* or Presta. Accordingly, the cited references not only fail to provide the requisite motivation, but fail as well to provide the requisite reasonable expectation of success. Applicants, therefore, submit that the Examiner has not established a *prima facie* case of obviousness over the instant claims.

Given the fact that the cited references in combination fail to establish the minimum elements of a *prima facie* case of obviousness, Applicants submit that the instant

claims satisfy the requirements of nonobviousness over these references, and respectfully request withdrawal of this rejection under 35 U.S.C. § 103(a).

OBVIOUSNESS TYPE DOUBLE PATENTING

The Examiner ***provisionally*** rejected claims 1-7 and 13 for alleged obviousness-type double patenting over claims 1-13 of co-pending U.S. Application No. 10/535,231. The Examiner also ***provisionally*** rejected claims 1-7 and 13 for alleged obviousness-type double patenting over claims 1-19 and 27-44 of co-pending U.S. Application No. 10/535,232.

Applicants traverse these rejections. Nonetheless, since these rejections are ***provisional***, Applicants will address the rejections upon allowance of a claim set in either this application, or the above-noted co-pending applications.

Applicants believe that all of the claims in the application are allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,

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